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TRANSPORTATION

No. 60



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## RAILROAD

### DEVELOPMENT OF BELORUSSIAN RAILROAD INDUSTRY 1981-1985

Minsk SOVETSKAYA BELORUSSIYA in Russian 16 Apr 81 pp 1,3

[Report of the Central Committee of the CP of Belorussia [KPB] and the Council of Ministers BSSR on "Measures for Improvement of the Work and for Over-All Development of the Belorussian Railroad in the 1981-1985 Period"]

[Text] In the decree adopted on this subject the KPB Central Committee and the Council of Ministers of BSSR noted the fact that in the 10th Five-Year Plan there was implemented a complex of measures for further development of the Belorussian Railroad and strengthening of its material and technical base. On a number of lines and in a number of sectors secondary tracks were laid and there was further development of the stations. The junctions and the repair base for rolling stock were developed and the introduction of means of automatics and telemechanics was continued. The track management was strengthened, the level of mechanization of the production processes was raised, the conversion of the train traffic to diesel traction was completed, the Krasnoye-Orsha sector was electrified and the electrification of the Orsha-Borisov sector was begun. Definite work was done to improve the organization of the transport process and the management of it, to cut down the number of inefficient shipments, to increase the volume of transport of freight in containers and packages, and to expand the network of points for the processing of this freight. The cooperation between the railroad and the other types of transport was improved and the level of traffic routing was raised.

The executives of the Belorussian Railroad, the managers of its subdivisions, and the party organizations have been devoting more attention to the training and placement of personnel and to the introduction of progressive methods of labor and techniques for making highly effective use of the transport facilities. The most important production links and sectors have been reinforced by the addition of skilled specialists.

In the context of an acute shortage of rolling stock, all this enabled us in the course of the last five-year plan to effect a 21.5 percent increase in the shipment of freight and to largely satisfy the growing transport requirements of the national economy and the population.

At the same time, the decree notes that there are some deficiencies and areas of neglect in the work of the railroad.



The plan for shipment of goods is not being fulfilled for the entire products list and as a result a number of associations, enterprises and organizations are accumulating finished output and are late in disposing of it because of the lack of railroad cars. We are not fully exploiting the reserves and potentialities for increasing the volumes of shipment of freight and expediting the deliveries of it through improvement of the use of the rolling stock. Recent years have seen a decline in the productivity of the railroad cars and an increase in the number of runs without load and in their layover time at the freight and technical stations and in repair. The technical condition of the locomotives has deteriorated and their average daily runs have been shortened. Improvements are needed in the organization of passenger transportation and in the quality of the service for passengers on the trains and in the stations as well as the work of providing for the safety of the train traffic.

The development of the freight handling facilities and the repair base for locomotives and cars and the expansion of the network of points for preparation of cars for loading are lagging behind the rates of increase of freight shipments. The growth of the capacities of the specialized subdivisions of the road and the Beltransstroy [Belorussian Transport Construction Trust] has been slow and the measures taken for improvement of the organization of the work of these organizations have been inadequate.

A number of ministries, state committees and departments of BSSR and some of the associations, enterprises and organizations are responsible for above-norm layovers of cars for loading operations, less than full use of the carrying and storage capacity of the rolling stock, and uneven presentation of the freight for transport. The curtailment of cross hauls and duplicate freight shipments is proceeding at a slow pace and the assignments for the processing of freight at night and on days off are not being fulfilled. These factors are causing large losses of freight resources.

The oblispolkoms, the Minsk gorispolkom, and the executives of the administration of the railroad and of the BSSR ministries, state committees and departments are still devoting little attention to the concentration of the freight work and the construction of trackside mechanized bases for general use, and to the closing of the approach tracks and stations with small freight turnover. We are not making use of the potentialities for increasing the capacities of the existing freight processing points by pooling the physical resources of the transport subdivisions of the railroad and the freight shippers and recipients.

The party committees and the primary party organizations are not exercising sufficient control over the activity of the economic managers with respect to the organization of socialist competition, adherence to a policy of economy and the establishment of stable labor collectives. The enterprises, organizations and institutions of the railroad have had a large personnel turnover, a great many violations of labor discipline, considerable overtime work, and substantial unproductive losses of working time.

The KPB Central Committee and the BSSR Council of Ministers have ordered the administration of the Belorussian Railroad to be guided by the decisions of the 26th

CPSU Congress and the 29th Congress of the CP of Belorussia in such a way as to provide for the development of the productive forces of the republic and the expected increase of the volumes of freight shipments and on this basis to prepare a long-term comprehensive program for the development of the road up to 1990 and to concentrate the chief attention on elimination of the disproportions and bottlenecks in the work of the road.

The administration of the Belorussian Railroad, the Beltransstroy trust and the other construction organizations working on the republic's railroad transport installations have been directed to provide for unconditional operation of the capital investments allotted for the development of this transport and also to prevent any instances of exceeding the normative periods of construction.

The decree provides for a number of concrete measures for further development of the material and technical transport base and the following measures in particular:

Completing the electrification of the Orsha-Brest railroad line, putting secondary tracks into operation, completing the work for extending the receiving and shipment tracks of the intermediate stations, equipping the road with automatic blocking devices, dispatcher centralization of a number of sectors and runs, and electric centralization with not less than 2,000 switches;

Putting into operation dwelling houses and public services and amenities for the existing housing, children's kindergartens and nurseries, 400-bed hospital in Gomel', and rest homes and living accommodations for the locomotive brigades;

Development and remodeling of nine large stations, further expansion and improvement of the freight centers and the approach tracks leading to them, construction of additional tracks, putting into operation of a point for the preparation of large-tonnage containers at station Vysoko-Litovsk, a mechanized freight processing point at station Lasosna, a shop for repair of the loading and unloading machines at station Lida, the starting of construction of a mechanized freight center at station Kolyadichi, completion of construction of a station in Grodno, the starting of construction of a station in Minsk, and enlarging and improvement of the waiting rooms and passenger platforms.

The decree also set forth specific measures for development of the locomotive, car, track, freight and power organizations and the communications facilities of the railroad.

The Beltransstroy trust was instructed to strengthen in the 1981-1985 period the material and technical base of the construction organizations under its jurisdiction.

The decree directed the administration of the Belorussian Railroad to provide for a 25 percent increase in the volumes of construction and installation work carried out by the method employing the organization's own resources and to build a base for the mechanization of the road construction and installation trust and a shop for large-panel housing construction.

Gosplan BSSR and Gosstroy BSSR were instructed to collaborate with the administration of the Belorussian Railroad and the Beltransstroy trust in submitting to the BSSR Council of Ministers in the first six months of 1981 suggestions for the 1981-1985 work of setting up new and increasing the capacity of the existing contract organizations which specialize in transport construction.

The KPB Central Committee and the Council of Ministers of BSSR ordered the administration of the Belorussian Railroad to carry out the following measures for increasing the effectiveness of the transport work:

Jointly with the BSSR ministries, state committees and departments and the associations, enterprises and organizations, are to provide for rhythmic fulfillment of the prescribed assignments for the transport of freight, particularly petroleum and petroleum products, fertilizers, agricultural machines, trucks, lumber and construction freight, motor tractor tires, and industrial and food products; they are not to permit any accumulation of finished products in the associations and the enterprises. Also, in the five-year period to increase the shipment of freight by 10.2 percent;

To take prompt measures for stepping up the level of the operational work of railroad transport and for effective use and increased reliability of the operation of the locomotives, cars and other technical facilities, to increase the sector speed of the movement of the trains and the productivity of the cars, to reduce their layover time for freight operations, at the technical stations, in repair and for the rectification of commercial defects;

To improve the quality of the planning of the train and switching work and to review the quality of the technology of the work of the stations and sectors for the purpose of effecting a significant reduction of the number of trains running without load and the layover times for them. To review the question of increasing the number of combined, transfer, export and sector trains and shunting locomotives;

In light of the experience gained in the interrelationships and in labor cooperation, to revise the common technological processes of the work of the stations and the transport shops of the associations, enterprises, motor vehicle enterprises and river ports;

To prepare and implement measures for more extensive use of the achievements of science and technology in organizing the transport process;

To step up the level of mechanization of the work in the loading and unloading of cars and in repair of the railroad tracks and to increase by 20 percent the volume of loading and unloading work carried out by the facilities of the railroad. To provide for acceleration of the processing of the rolling stock at the freight centers by organizing around-the-clock fulfillment of the freight operation, by changing the operating schedule of the production sectors, and by improving the use of the machines and mechanisms. Also, to provide for strict fulfillment of the schedule for the movement of trains, especially passenger trains. To improve the quality of the preparation of the passenger train for the run, the organization of the sale of tickets, and the work of the inquiry and information services, and to



step up the efficiency of the services for passengers at the stations and on the trains. To strengthen the control over the use of the compartments on the passenger trains. To add to the rotation two company trains. The oblispolkoms were ordered to allot spaces for the opening of city ticket offices for the advance sale of tickets for all the types of transport, including one office in Brest, two in Vitebsk, two in Gomel', one in Grodno and two in Mogilev;

To take measures for strengthening labor and production discipline, improving the maintenance of the technical facilities and reinforcing the preventive work to insure the safety of the movement of trains;

To eliminate the deficiencies in the selection and placement of supervisory personnel and to improve the work with the reserve of personnel and specialists of the average unit. To step up the performance discipline and responsibility of the economic managers with respect to fulfillment of the plan and the socialist commitments.

Gosplan BSSR, Gossnab BSSR, the administration of the Belorussian Railroad, the BSSR ministries, state committees and departments, the oblispolkoms, and the Minsk gorispolkom were ordered to improve the planning of shipments of freight by railroad transport and its cooperation with the other types of transport and the national economy sectors. With these ends in view, the decree calls for the following measures:

During 1981 to analyze the current economic transport links, to take measures for optimizing their operation, and on this basis to reduce the inefficient shipments and irrational transport expenses;

To provide for switching not less than 160,000 tons of freight from railroad to other types of transport. In particular, the Mozyr' oil refinery is to put into operation in 1982 a distributing unit for the organization of shipment of petroleum products for short distances by truck transport;

In the plans for the distribution of local building materials and reinforced concrete products and structures and in the plans for interoblast deliveries to provide for exchange operations involving output of the same kind regardless of the departmental subordination of the enterprises which manufacture this output;

In planning the shipments of output to provide for the consolidation of the freight flows according to origin and direction;

To prepare and implement measures for further development of container and package shipments of freight in the 1981-1985 period, to require an increase in the manufacture of container and packaging equipment, and to expedite the turnover of this equipment. The volume of container shipments of freight must be increased by 10 percent. Gosplan BSSR is authorized to establish for the BSSR ministries, state committees and departments and the associations, enterprises and organizations assignments respecting the volume of shipment of freight in containers and packages for each year of the five-year plan;



To plan and provide for maximum shipment of frozen products to the consumers before the onset of the freezing weather. Additional measures must be carried out to prevent freezing of the goods and the places of unloading must be equipped with devices for warming and loosening them;

To provide for the shipment of freight from the stations and acceptance of it by the recipients in an amount not less than 20 percent of the total volume received on the second shift and not less than 10 percent on the third shift. To increase by 10 percent the volume of shipment of freight on days off and by 11 percent the hauling of freight from the stations by general-purpose motor transport. To reduce by 20 percent the average daily balances of unshipped goods at the stations;

To strengthen the control over the care of the railroad car fleet engaged in freight operations and shunting work at the stations and on the approach tracks; also, control over the full unloading and cleaning of the cars to remove the residues of the previously shipped freight;

To enlarge the role of the commissions for coordinating the operations of the various types of transport and the role of the coordination groups at the transport centers in resolving the problems of rationalization of shipments;

To concentrate the attention of the transport collectives on the elimination of losses of freight loading resources. To check the actual fulfillment by the subordinate associations, enterprises and organizations of the technical norms for loading of cars and on the basis of the results of this check to implement measures designed for improving the use of the carrying and storage capacity of these cars. To bring to 43 percent the level of the nighttime freight work.

The KPB Central Committee and the BSSR Council of Ministers ordered the oblispolkom and the Minsk and a number of other gorispolkoms to provide in the 1981-1985 period for granting to the railroad transport workers and those engaged in tasks connected with the movement of trains the opportunity to enjoy first priority in entering housing construction cooperatives.

The decree orders the KPB obkoms, gorkoms and raykoms and the oblispolkoms, the gorispolkoms and rayispolkoms to establish permanent control over the fulfillment of the decree. Also to take prompt measures for elimination of the difficulties in the work of the railroad transport and render assistance to the transport organizations in fulfillment of the assignments for increasing the effectiveness of the use of the transport facilities, improvement of the organization of transportation of national economic freight and passengers, providing for coordinated operation of the various types of transport, and organizing political, organizational and educational work for extensive participation by the transport collectives in socialist competition, fulfillment of the plans and socialist obligations, and strengthening of discipline among the transport workers.

The BSSR State Committee for Television and Radio Broadcasting and the editorial staffs of the republic, oblast and rayon newspapers are authorized to extensively publicize the work of railroad transport and the way in which the workers make highly effective use of the transport facilities and the achievements of the best collectives, the outstanding workers and the production innovators.

## RAILROAD

### SPARE PARTS SHORTAGE, NEED TO IMPROVE MAINTENANCE OF LOCOMOTIVES NOTED

Moscow ELEKTRICHESKAYA I TEPLOVOZNAYA TYAGA in Russian No 8, Aug 81  
pp 2-5

/Interview of Deputy Minister of the USSR Ministry of the Railways,  
A. T. Golovatyy: "A Difficult Task, But One That Can Be Fulfilled"7

[Excerpt] At present the work of railroad transport depends to a large extent upon the timely plant maintenance of locomotives and the manufacture of spare parts for them. Our correspondent, V. I. Alekseyev, asked Deputy Minister of the Railways, A. T. Golovatyy, to comment on how things stand in this sector and what steps are planned to develop the plant base as required by the decisions of the 26th Party Congress.

/Question7 Aleksandr Terent'yevich, tell us how the plants of the USSR Ministry of the Railways, especially the locomotive maintenance plants, wound up the 10th Five-Year Plan.

/Answer7 Plant maintenance plays an important role in the planned preventive maintenance system for locomotives. When performing mid-point and capital repair work the operating characteristics of locomotives are restored; and basic units are replaced with rebuilt or new units. Moreover, nearly 10 percent of all rolled ferrous metals and 9.5 percent of all rolled non-ferrous metals are replaced; 12 percent in electric locomotives and 30 percent in diesel locomotives. During capital repair work 100 percent of the black cables from the expenditure of these materials during the building of the locomotives are replaced.

In diesel locomotives the bushings of the working cylinders of the diesels, the pistons and piston rings, the main and connecting rod linings of the crankshafts, the motor and axle bearings and other equipment are completely replaced. During the capital repair work all high and low voltage wiring is replaced. As you can see, locomotives leave the maintenance plants completely renovated.

The plants of the Main Administration for the Repair of Rolling Stock and the Production of Spare Parts completely fulfilled the plan of the

10th Five-Year Plan for volume of production, growth in labor productivity and profit. During this period the volume of production increased by 21.6 percent (against an assignment of 20.5 percent), realized 193 million rubles worth of product in excess of the plan; labor productivity rose by 19.3 percent and 15.1 million rubles of excess profit was obtained.

The best results in fulfilling planned assignments were achieved by the collectives of the Dnepropetrovsk diesel locomotive repair plant; the Daugavpils and Moscow locomotive repair plants; the Ussuriysk, Velikolukskiy and Sverdlovsk electric locomotive repair plants and several others. For their successes in the 10th Five-Year Plan among the locomotive maintenance plants, the Sverdlovsk and Moscow locomotive repair plants and the Michurinsk and Dnepropetrovsk diesel locomotive repair plants were awarded the Challenge Red Banners of the CPSU Central Committee, the USSR Council of Ministers, the All-Union Central Trade Union Council and the Komsomol Central Committee. The collectives of some 40 plants were awarded the Challenge Red Banners of the USSR Ministry of the Railways and the Central Committee of the Railroad Workers Trade Union for successfully fulfilling the assignments of the 10th Five-Year Plan for each quarter.

It must be noted that not all enterprises managed to fulfill planned assignments. In recent years the Orenburg, Tashkent, Astrakhan and Voronezh diesel locomotive repair plants have been operating very poorly. At these plants work is poorly organized, there is an irregular production of product, and production capacities and internal reserves are not being used fully. It is the fault of these and certain other plants that the plan for product nomenclature, primarily the repair of diesel locomotives and the manufacture of spare parts, was not fulfilled in the 10th Five-Year Plan.

/Question/ I would like to learn more about the quality of locomotive maintenance.

/Answer/ In the decisions of the 26th Party Congress it is emphasized that one of the main directions in the development of the economy is to raise the quality of the product that is manufactured. For us, the railroad workers, raising the quality of the maintenance of rolling stock is especially important, for it is directly linked with ensuring the safety of train traffic.

It is necessary to say that the quality of locomotive maintenance is constantly in the center of attention of the plant collectives. Governed by the decree of the CPSU Central Committee concerning the experience of the work of the enterprises of L'vov Oblast for the development and implementation of a comprehensive system for product quality control (KSUKP) and the decision of the Ministry of the Railways collegium concerning the dissemination of this advanced experience, the plants are completing the adoption of elements of this system.



For example, at the Ulan-Ude plant alone during the first years that this system was in operation the percentage of wastage dropped 3.2-fold. At the Daugavpils, Smelyanskiy and Moscow locomotive maintenance plants and at several other plants more than 90 percent of all product is released upon first presentation. At these enterprises the executors themselves are responsible for improving the quality of rolling stock maintenance through the use of moral and material incentives. Many workers at the plants have received their own individual marks and earned the right to release product without submitting it to the quality control department.

At the Daugavpils, Rostov, Chelyabinsk and other plants product quality control is performed at all stages of production. This includes a quality check of incoming materials, semi-manufactures, assembly parts and a quality control during the manufacturing process and maintenance, and norm quality control of the design and technical documentation.

The adoption of system measures has yielded a noticeable effect. During the 10th Five-Year Plan the percentage of complaints dropped on diesel locomotives, electric locomotives, electric sections and diesel-trains.

Unfortunately, I must point out that high-quality maintenance of rolling stock does not exist at all plants. Things are not so good at the Tashkent, Voronezh diesel locomotive maintenance plants, and at the Tbilisi, Krasnoyarsk and other plants. The largest number of complaints have been received regarding the maintenance of electrical machinery and equipment.

/Question/ Tell us about the efficiency of cooperation between the collectives of the plants and the depots. How is this experience being disseminated?

/Answer/ As early as 1977 the Ministry of the Railways and the Central Committee of the Trade Union of the Railroad Workers reviewed and approved the initiative of the collectives of the Chelyabinsk electric locomotive maintenance plant and the Zlatoust depot, which had contracted to cooperate and share responsibility for the high quality of maintenance, servicing and effectively operating locomotives. The technical cooperation between these collectives is still in effect. The results of this cooperation attest to the high efficiency of combined measures of a plant and depot which are aimed at increasing the quality of maintenance work of the VL10 electric locomotives and raising their reliability.

During the past three years the operational indicators of these locomotives have noticeably changed for the better. There have been only half as many comments arising during the acceptance process and in the course of breaking in tests. There has been a 10 percent increase in the number of electric locomotives that are put into operation upon first presentation. The number of defects during the warranty period has decreased 4-fold.



The increase in the reliability of repaired electric locomotives is achieved by the strict execution of joint measures. This includes quarterly joint checks of the quality of plant and depot repair work and the competent technical operation of the electric locomotives.

The Rostov workers on the basis of a contract to cooperate with the Bataysk depot have come up with a standard for the enterprise, which determines the obligations and joint responsibility of the plant and depot to improve the quality of maintenance and operation of electric locomotives. Within the scope of the contract the plant performs all kinds of modernization of traction engines and helps the depot with documentation, tools and technical rigging. The plant and depot workers regularly analyze the malfunctions of individual units and parts of the electric locomotives which break down during operation. On the basis of their analysis they come up with and carry out measures to improve the reliability and service life of these units. At present the work of the maintenance personnel is evaluated according to data of the unplanned repair jobs on electric locomotives.

While developing this initiative, the Moscow LRZ /Locomotive repair plant/ in 1981 concluded a contract to cooperate with the locomotive service of the Moscow Railroad. The collective of the Moscow electro-mechanical repair plant, which provides the Moscow Railroad and the Moscow LRZ with the maintenance of traction engines, has also joined this contract. The collectives of the VNIIZHT /All-Union Scientific Research Institute of Railroad Transport/ and the PKTB for locomotives have also agreed to participate in the contract arrangements.

At present this undertaking has been widely disseminated. Today there are already 18 plants of the main administration which have concluded contracts to cooperate with 23 locomotive depots. The Velikolukskiy, Poltava and Ulan-Ude plants have such contracts with two depots; and the Michurinsk plant with four. As you can see, this very useful initiative is developing and is yielding good results.

/Question/ How do things stand with the production of spare parts?

/Answer/ At the present time supplying the railroads and the maintenance plants with spare parts is a most urgent problem. The technical condition of locomotives and observance of the system of planned preventive maintenance depend upon the timely and total supply of spare parts, particularly for diesel locomotives, to the maintenance enterprises.

Today the locomotive spare parts are manufactured at 48 plants in a total amount of 250 million rubles. And what is more the manufacture of spare parts is constantly increasing. During the last three years of the 10th Five-Year Plan alone the delivery to the railroads of diesel 2D100 bushings has increased by 20 percent, piston rings by 21 percent, diesel bearings by 10 percent, traction transmission gears by 90 percent, and locomotive brake shoes by 16 percent.

However, the requirement of the maintenance enterprises of the railroads for spare parts is not being fully met. There is a particularly acute shortage of operating cylinder bushings for the D100 diesel locomotives and of pistons. To increase the production of operating cylinder bushings for the D100 diesels at the Dnepropetrovsk and Poltava diesel locomotive repair plants they are modernizing the cast iron shops. The Daugavpils plant has been tasked with organizing the mechanical processing of bushings. These undertakings in the very near future will make it possible to increase the production of bushings by 20 to 25 percent.

Starting in 1981 industry is supplying our plants with automatic lines for the production of pistons, which will make it possible to increase the output of these scarce parts.

A radical restructuring of the production of piston rings is now coming to an end. This will begin with the blank billets and end with the finishing operations. In the past two years by including the Michurinsk and Izyum plants in mechanical processing of piston rings there has been a significant expansion of their production and the requirement of the railroads has practically been met. To increase the production of pistons at the Lyublino plant in the current year they are putting into operation two automatic lines for the tooling of pistons.

Supplying the railroads with locomotive brake shoes is connected with the steady fulfillment of the plan for the production and improving their quality at the Tashkent plant. In addition, the completion of the production facility at the Vologda plant will make it possible by the end of 1981 to produce no less than 400,000 items per year at this plant.

Prefabricated metal buildings will be installed and put into operation at the Michurinsk, Rostov, Daugavpils, Tashkent, Velikolukskiy and Poltava plants to increase the production capacities for manufacturing spare parts during the years 1981 through 1986 as soon as possible.

The prospects for expanding the production of single parts and the manufacture of spare parts on a small scale at the main administration's plants are directly linked with the scale on which numerically controlled (NC) machine tools are adopted. It is planned during the years 1981 through 1985 to organize 15 sectors, equipped with such machine tools which employ an ASV21 computer. At the Velikolukskiy plant such a sector is already in operation. Several NC machine tools are being successfully operated at the Krasnyy Put' plant and at the Poltava, Ussuriysk, Smelyanskiy and Ulan-Ude plants.

A constantly developing production of spare parts depends to a large extent upon the development of foundry and forge shops and of molding and metal working sectors. For this reason in the 11th Five-Year Plan it is planned to complete the modernization of 14 steel casting and 13 iron foundry shops.

/Question/ As regards the acute shortage of some spare parts, what can you tell us about the effectiveness of using recycled locomotive parts as a resource?

/Answer/ In my opinion, the utilization of operable locomotive parts in maintenance work is a source of tremendous and very efficient reserves. This problem is directly linked with the key national economic task that was posed by the 26th Party Congress - the economical expenditure of materials.

In accordance with technical specifications at TsTVR plants the parts of the crank and piston group (pistons, bushings, and D100 diesel inserts), which comply with the requirements of depot repair rules, are shipped to depots for further use in operational conditions. For 1981 it is planned to ship 28 D100 pistons, 10,000 bushings, and 13,000 inserts, which had been used previously. And that is all.

Why shouldn't railroad transport switch to the repair of diesels on a graduated size basis? Motor vehicle repairmen have had some good experience in this direction. The reoutfitting of production lines which manufacture pistons, pistons rings and other parts in any graduated size, does not present any particular difficulty. The desired effect will be achieved by conserving scarce and labor-intensive bushings. At the same time a shortage of scarce crank and piston parts will be eliminated using comparatively few assets.

A deeper analysis would make it possible to discover many other possible objects that can use outmoded parts. In this area we are awaiting assistance from our scientists and locomotive designers.

/Question/ What fundamental tasks will the repair plants be solving during the 11th Five-Year Plan?

/Answer/ During the 11th Five-Year Plan the repair of diesel locomotives and electric locomotives will increase by 13.6 percent, electric trains by 16.2 percent, diesel trains by 17.6 percent, and traction electric motors for diesel locomotives by 51.6 percent.

There will be a sharp increase in the delivery plan for spare parts for the railroads: D100 diesel bushings - by 37.6 percent, pistons by 19.4 percent, and piston rings by 13.3 percent. This means that by 1985 the maintenance needs for diesel locomotives and electric rolling stock will be largely met.

This will be achieved for the most part at the plants by raising production efficiency and also by speeding up the assimilation of new capacities at the Voronezh, Tashkent and Ussuriysk plants. By 1985 the diesel locomotive maintenance capacity at the Ufa plant must be brought to the established level and the specialization of the Póltava plant in the repair of TEP60 and M62 diesel locomotives must be completed.



To meet the railroads' needs for diesel repair it is necessary to assimilate the planned capacity of the Orenburg plant's diesel shop as soon as possible and to raise the work efficiency of all existing shops by adopting conveyor and flow production lines and other means of mechanization. It is also necessary to ensure in all diesel shops the fulfillment of the diesel production norms that were achieved by the Daugavpils plant. In addition, it is planned during the current year to set up the repair of diesels at the Ufa plant.

To guarantee the repair of electrical machinery in 1982 it is necessary to assimilate the planned capacities of the electrical machinery shops of the Ussuriysk and Alma-Ata plants and in 1983 we must assimilate the new electrical machinery shop of the Voronezh diesel locomotive repair plant, and by the end of the five-year plan to do the same at the Orenburg plant.

To ensure that we can meet the needs of the railroads for the repair of electric rolling stock by the end of the five-year plan, we must as quickly as possible assimilate the new capacities at the Yaroslavl' electric locomotive repair plant, the L'vov and Krasnoyarsk plants, and expand the Chelyabinsk plant's capacity for repairing electric locomotives. We must also assimilate the planned capacity for repairing electric locomotives at the Tbilisi plant and specialize the Zaporozh'ye electric locomotive repair plant in working on the ChS electric locomotives.

In the 11th Five-Year Plan the plants must triple the volume of construction and installation work on production-related projects. The expansion of nearly all plants, where work commenced before 1981, must be completed. And work must get underway on 26 construction projects.

At the 26th Party Congress emphasis was placed on the need to strictly conserve material and energy resources.

The TsTVR plants are the largest consumers of material resources in the railroad transport sector. We use more than 75 percent of the rolled metal and more than 97 percent of the Ministry of the Railways' allocation of pig iron and ferrous alloys. For rolling stock repair work each year the plants receive several thousands of tons of rolled copper and copper wire, a significant amount of electrical insulation materials, tens of thousands of tons of raw materials for non-ferrous casting, and hundreds of thousands of cubic meters of timber.

The progressive technically sound norm setting is one of the basic trends in the rational use of material resources. Within the very near future it is necessary to sharply raise the quality of developing such norms and of analyzing the expenditure of spare parts and materials on the railroads and at the plants. It is also necessary to establish progressive technically sound norms, which are based on the adoption of waste-free stampings, and to search for and make use of internal reserves, and to create at the plants and on the railroads commissions on the conservation of material, energy and labor resources for 1981 and the following years.



/Question7 Tell us where the basic reserves of the plants are to be found?

/Answer7 To fulfill the 11th Five-Year Plan assignments the intensification of production and speeding up the growth of labor productivity are of utmost importance. Production intensification is provided by technical progress and improving norm setting of labor. Increasing labor productivity by just one percent will make it possible overall for the main administration's plants to increase the annual value of product output by 14 million rubles.

The correctly posed labor norm setting presupposes the massive use of technically sound time norms. At present the percentage of such norms is low at several plants. In 1985 we must achieve a 75 percent level of such norms on the average. This is a realistic goal, and plant managers must carefully organize labor norm setting, reexamine artificially deflated and outdated output norms and introduce technically sound norms in all basic operations.

At present more than 9,000 brigades, of which 7,500 are in basic shops and 1,540 brigades are in auxiliary shops, have been organized at plants of the main administration. The total number of workers now working under the brigade form of labor is 45.6 percent. But this is not the maximum. The main task in this matter is to have at least 60 percent of workers working under the brigade system at our plants during the 11th Five-Year Plan.

Of considerable importance in speeding up technical progress is the use at our plants of modern, highly productive equipment. This is in keeping with the Decree of the CPSU Central Committee and the USSR Council of Ministers, which concerns "measures for improving the work and comprehensive development of railroad transport during the years 1981 through 1985."

However, there are already instances when equipment that has been received is not being put into operation for long periods of time. This disturbs us quite a bit. The main administration is taking decisive actions to eliminate such problems. It is totally intolerable that unique equipment should be allowed to sit in the warehouses.

/Question7 All machine operators want to know what sort of modernization of units and assemblies is planned in the 11th Five-Year Plan?

/Answer7 The plant main administration and the locomotives main administration and the All-Union Scientific Research Institute of Railway Transport develop measures to further raise the service life and operating reliability of the more important units of locomotives and diesel trains for each five-year plan. For example, in the 10th Five-Year Plan these measures included for diesel locomotives and diesel trains 50 large tasks and 66 for electric rolling stock.

The modernization of electric locomotives will be directed at further raising their reliability. In the 11th Five-Year Plan 140 VL10 electric locomotives of the first to be manufactured group are to be brought up to the circuitry of the series locomotives. The electrical circuitry of 70 VL80R electric locomotives will be brought up to the circuitry of the VL80K. The circuitry of 300 VL80K electric locomotives will be redone according to the series type. All electric locomotives used for passenger service will be equipped with heating systems. Preparations are underway to standardize the bucket suspension on VL10 and VL80 series electric locomotives.

The plants are carrying out substantial modernization work on diesel locomotives. At present all plants are adopting the hardened rolling of the hollow chamfers of diesel crankshafts. As a result the formation of cracks has been reduced from 20 to 4 - 5 percent. The replacement of blower pipes by turbocompressors on shunting diesel locomotives will significantly increase the reliability of this unit. Changing the design of the cylinders of the spring suspension on diesel locomotives by converting the friction of sliding into friction of rolling will make it possible to sharply reduce wear of these parts. To improve work and increase the reliability of traction electric motors and traction geared transmissions, diesel locomotives are being equipped with an elastic geared transmission while in for plant repairs.

In accordance with a special program, the plants are starting to modernize the EDT-200, ED-107 and ED-107A traction electric motors. This program includes reinforcing the housing insulation, replacing the rear pressure plates of the armatures, welding the terminal armature cores, knurling the shafts, reinforcing the outlets and securing the terminal turns of the coils of the main and secondary poles.

Among the other jobs the most important are: replacing the sections of the cooler with turbolators of the oil flow with a water-oil heat exchanger in type TE10 diesel locomotives; installing grooveless crankshaft and connecting inserts on the crankshafts of the 2D100 and 10D100 diesels; and improving the sound proofing of the diesel locomotive operator's cabin.

In addition, during the current five-year plan the TE3 and TE10 diesel locomotives will be thoroughly modernized. During capital repair work new diesels, traction electromotors, reduction gears, cooling units and other equipment will be installed.

/Question/ What are your wishes as regards the operators' role in raising the efficiency of the traction motors?

/Answer/ One cannot avoid the most crucial problem of the transport sector - the condition of the locomotives' electrical equipment. At the repair plants everything possible is being done to organize their repair and to raise the efficiency. However, we must point

out that failure to observe the rules and instructions for operating and maintaining electrical machinery at the depots causes it to break down before it should and increases the amount of machinery coming in for capital repair work without having logged the required number of kilometers.

Quite often the depots send to the repair plants locomotives with traction motors which do not require plant repair for any reason - it is in good condition and it has not logged the required number of kilometers. Frequently the repair plants receive electrical machinery that has been disassembled. Much of this machinery is either not accompanied by its passport or the passport does not contain data on the number of kilometers that it has logged. As a result, it is impossible to determine the actual distances covered by the electrical machinery.

Raising the efficiency of traction motors is a task shared by our main administration and the locomotive main administration. For this reason in addition to improving the quality of their plant repair work the locomotive depots need the following to eliminate these shortcomings: to strictly observe the established rules for loading and transporting electrical machinery; to put an end to disassembling and substituting electrical machinery that is sent in for plant repair work; ensure the availability of passports for the electrical machinery and to standardize them; keep strict records on the number of kilometers logged from the time it is built and between repair jobs. When sending electrical machinery in for repairs along with the diesel locomotives it is mandatory that the number of kilometers logged be checked. And electrical machinery that is in good condition and has not logged the required number of kilometers should not be sent in for repairs.

Also, it is necessary to improve the maintenance of electrical machinery at the depots and to strictly observe the instructions for their operation and to perform preventive maintenance in accordance with existing rules on a timely basis. When performing the final raised repair it is advisable to install traction motors on the diesel locomotives with a calculation that will permit them to be sent in for repair work after logging the required number of kilometers. This will prevent them from being sent to the repair plant before they have logged the required number of kilometers.

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## **RAILROAD**

### **OFFICIAL DISCUSSES CONTAINERIZED RAIL TRANSPORT**

Moscow GUDOK in Russian 25 Jun 81 p 2

[Article by First Deputy Minister of Railways F. I. Shuleshko: "Practical Affairs Decisions of the 26th CPSU Congress--The Containerization Policy"]

[Text] The basic directions of the economic and social development of the country, as approved by the 26th CPSU Congress, include the statement: "To accelerate the development of the container transport system, to expand the shipment of packaged piece goods freight by the container packaging method, and to enlarge the network of special points outfitted with equipment for the processing of containers and packages.

In fulfillment of this party congress directive, a broad program of work was prepared and approved. It provided for putting into effect in 1981-1985 and in the subsequent five-year plan a large complex of effective measures for speeding up the development and increasing the effectiveness of the container and package shipments.

The policy calling for containerization and packaging of freight shipments was dictated by life itself and by technical progress. This is first of all the surest way to achieve full mechanization and automation of the loading and unloading operations and freeing a large number of people now engaged in heavy and unattractive manual labor. So the development of container and package transport is not only a technical and economic problem but, to a significant degree, also a social one. The trend is such that in the future, with the growth of prosperity and culture, people will be unwilling, even for high wages, to move heavy freight. We must not fail to take this into consideration.

A convincing indication of the sizable effect of container and packaging technique is that the labor productivity of the workers engaged in loading and unloading operations has increased four-five-fold and the cost of carrying out the work has been cut down to 1/3-1/4 of the former level.

And this is by no means the entire effect. The container system creates immeasurably better conditions for more efficient and more effective interrelationships between the various types of transport and for more extensive use of the progressive variant of the organization of shipments—"from door to door." In other words, a fundamental change in the quality of the transport service. In addition, it creates the most favorable conditions for making sure of the safety of the freight



and for protecting it from damage in the transport process. It facilitates and simplifies the warehousing and storage of the products, including the most valuable ones. And how can we fail to consider the enormous saving of equipment and materials in the crating and packaging?

All this also predetermines the greater attention which the Communist Party and the Soviet government devote to development and improvement of container and package shipments.

The 11th Five-Year Plan called for the production and delivery to transport of 1.015 million general-purpose and specialized containers, including 135,000 large-tonnage ones. Mass production of packaging equipment is being organized. Production of trays of varied modification is being increased 3.5-4-fold and production of multiple-thread slings more than tripled. We will develop the necessary production capacities for mass manufacture of package shaping machines and assemblies as well as polymeric tape and coating for the packaging.

On the railroads we have enlarged the yard for the processing of large-tonnage containers. To carry out operations with these containers we plan to build and put into operation during the five-year period 65 additional container points. There will be a sharp increase in the delivery of cranes of the new designs and other modern, highly productive equipment.

Transport will thus gain a great deal and its technical equipment will be considerably strengthened. However, the volumes of work slated for development will be very large and the assignments prescribed very intensive. By the end of the five-year plan it is planned to bring the volume of container shipments to 125-135 million tons a year for the national economy as a whole. Approximately one-third of this amount--40-45 million tons--will be in large-tonnage container. A considerable proportion of this work must be done by the railroads. The total volume of container shipments here comes to 72-75 million tons and 30-33 million tons are in large-tonnage containers.

The increase in container shipments is stipulated as a very substantial one--nearly double. We would remind you that in the last--the 10th--five-year plan it amounted to 16.6 percent. The national economy requirements for this type of freight transport are a long way from being fully satisfied.

Fulfillment of the prescribed assignments requires that we be even more persistent and energetic in improving the technology and organizing the work, in making general use of progressive procedures and methods of labor and in uncovering and exploiting the intraorganizational reserves.

There are considerable reserves and potentialities here. In the last five-year plan (in 1980 as compared to 1975) the turnover of containers was slowed up by 6.7 days. This entailed an enormous loss of loading resources and a substantial slowing of the delivery of the most valuable goods. There were undoubtedly objective causes operating in this also. In particular, the average distance of the shipments of freight increased by 311 kilometers during the five-year period. And this cannot be ignored. However, there have been great losses due to serious miscalculations in the organization of the work.

In many places the transport of containers from the stations has been extremely unsatisfactory. Often containers ready for shipment are delayed for days waiting for a delivery of railroad cars. Other customers convert the containers into storehouses for long-term storage of products. And sometimes no one questions them about this. A number of railroads, particularly the Oktyabr', the North Caucasus, the Central Asian, the East Siberian and the Transbaykal, despite a considerable surplus inventory are not fulfilling the plans for the shipment of freight in containers.

We can no longer reconcile ourselves to the fact that every year thousands of containers remain through the winter at the river ports. They are cut off from operations for three-five and even more months. It is essential that these shipments be planned more thoughtfully and more prudently.

We also have no right to close our eyes to the fact that many containers sustain damage. And the managers of many of the stations do nothing to pin responsibility on the careless customers who are to blame for the damages. On a number of railroads the repair and preparation of the containers for shipment are poorly organized.

The task is to see to it that all these deficiencies are eliminated as rapidly as possible. The figures show that handling of the growing volumes of shipment requires that in the current year we start to speed up the turnover of containers by a minimum of 10-15 percent. And it is mandatory that we achieve this objective. Actually, in the last number of years we have seen an acceleration of the rates of deliveries of containers and packaging means. It is necessary now too to process the increasing flows of freight. The only solution is better and more productive use of the operational fleet and the finding of reserves for the saving of time in every phase of the turnover.

And now about the development of package shipments. In the last five-year plan the volume of these increased by 59.6 percent and reached 160 million tons in 1980. The rate is not low and the volume would seem to be considerable. But the figures show that there are now being presented to the railroad for shipment approximately 900-950 million tons of freight during the year which it is expedient to deliver in packaged form. For example only 30 percent of the bricks shipped are packaged and not much more than 48 percent of the firebrick products! And how much manual labor must be expended because of this in the loading and unloading! How great are the losses from defects which develop in the bricks or firebricks! It is also possible and necessary to step up considerably the level of packaging of lumber (in 1980 the level was 17.6 percent), rolled steel and pipe (55.5 percent in 1980), and other piece-goods packaged freight.

The 11th Five-Year Plan calls for more than doubling the packaged shipments. In 1983 the total volume of these will be 325-345 million tons, including 152-164 million tons of building materials and products.

The chief role in the accomplishment of this task must undoubtedly be played by the shippers of the freight. They are obliged to package their products when they prepare them for the shipments. But the railroad workers should not have to also occupy the position of outside supervisor. After all, we are highly motivated for all

possible development of packaging. This means that we must be more persistent and more demanding toward the freight shippers who are dragging their feet in converting to operation by the new system and, with the help of the local party and soviet organs and the people's control organs, we must obtain unconditional fulfillment of the prescribed assignments. It is also necessary to look after the safety of the multiple-thread trays and the slings and to insure their prompt return from the unloading points to the loading sites. All this must be well thought out and efficiently implemented.

The policy of all possible development of containerization and packaging of shipments requires a fundamental improvement in the planning and control system for them. With this in mind, we set up a main administration of container and package shipments and mechanization of loading and unloading operations with the appropriate subdivisions at the railroads and at the branches and sites. The mechanized divisions for loading and unloading operations have been placed under the control of the newly established main administration. There is thus evolving a harmonious structure of control, similar to that existing in other sectors of our railroad system.

What do we expect from this structural reorganization?

It is now very important that we proceed more thoughtfully, more purposefully and with thorough regard for the modern requirements—proceed to shape a technical policy in respect to container and package shipments.

There is a very great deal which must be well tied together and coordinated--the equipment and the technology and the control system. There are now several variants of the system for automatic control of the container terminal through use of EVM [electronic computers]. Which of these variants should be made standard for wide use? Several types of automatic slings have been developed. Which should be given preference? This is only a small proportion of the technical problems which the specialists of the new main administration must resolve. And just as broad is the group of questions pertaining to improvement of the technology.

The state is investing large amounts of assets in containerization. Who is to do the monitoring to see that these allocations are used in optimum fashion, that all the planned installations are put into operation on schedule and at a high level of quality, and that the development of this project proceeds on a comprehensive basis? Of course, the workers of the new main administration and its local subdivisions. Experience shows that when an industry has definite management it is capable of doing a great deal by calling upon supplementary local financial and material resources and its own manpower.

A great deal needs to be done in the newly organized sector to generalize and disseminate the advanced experience and procedures and methods of labor and for the development of socialist competition. A number of railroads have acquired positive experience in comprehensive fulfillment of all the basic freight and commercial operations. In particular, a great deal of valuable work has been done in Gor'kiy, Kazan', and Kaliningrad. All this must be taken into account, comprehended and made general property. But is it really necessary to discuss all the affairs to which the new main administration must address itself!

They may ask: what problems will now be addressed by the specialists of the shipping main administration and its services on the railroads? They can concentrate their attention and efforts on the extremely important problems pertaining to improvement of the planning, rationalization and routing of the shipments and better utilization of the freight capacity and tonnage of the rolling stock. In any fundamental improvement there is need for cooperation with the customers. Who if not the workers of this main administration and its service should be concerned in the most serious way with the development and general introduction of the CPSU Central Committee-approved work experience of the railroad transport enterprises and the industrial enterprises of L'vovskaya Oblast with respect to effective use of the railroad cars! Also quite broad is the group of problems relating to improvement of the commercial work and the measures required for safeguarding the freight shipped. In this regard we have many areas of neglect and tasks which are not getting action, so to speak.

Implementation of the complex of measures designed to accelerate the development and enhance the effectiveness of the container and package shipments will undoubtedly have great national economic importance. They will create better conditions for full and prompt satisfaction of the country's economic requirements in respect to shipments as called for by the decisions of the 26th CPSU Congress. The more widespread use of containers will enable us to save approximately 900 million rubles in the loading and unloading work alone. A substantial effect! And when we take into account the other savings obtained from the containerization and packaging of shipments, the effect will prove to be far greater.

In his review report to the 26th CPSU Congress Comrade L. I. Brezhnev called the reduction of transport costs a major state task. The policy of containerization and packaging of shipments will undoubtedly help for successful accomplishment of this task. It is important that we be persistent in seeing to it that everything projected and planned is consistently and fully put into practice.

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## RAILROAD

### LAXITY CAUSE OF INCREASED FIRES IN RAILROAD CARS

Moscow GUDOK in Russian 21 Jul 81 p 3

[Letter from MGU [Moscow State University] students Z. Kuliyeva and K. Kerimov:  
"Why the Railroad Car Was On Fire"]

[Text] It happened on 4 June at 1540 hours at station Aydyrlya on the Orsk branch of the South Ural Railroad. Train No 2606 guard L. Kazaryan reported to the station duty officer that car No 2252432 of the train was on fire. When he received the report, A Koyukov immediately got in touch with the firefighting unit and transferred the train to a safe track. The firefighting company began the job of extinguishing the fire. Thanks to the skillful actions of the crew--driver A. Tarasov, fireman V. Alekseyev, and their volunteer assistants, the fire was put out. The incident was managed without any injuries and there was no disruption in the movement of the trains but some freight--51 Apsheron refrigerators--were totally destroyed. It was revealed that sparks from the exhaust pipe of the shunting locomotive got through cracks in the car on to the freight. And the freight was in highly combustible packing. So because of the careless attitude of the shippers at station Kishly on the Azerbaijan Railroad, the state suffered a serious loss.

Another case. On 16 June at the 29th kilometer of the Aleksandrovskaya-Verevo run of the Oktyabr' Mainline the emergency brake broke in the lead car of an electric train. The passengers, who had stopped the train, ran to the train engineer's compartment, shouting "Fire!" The flames had already spread through the lounge car. Engineer V. Igotti stopped the train and got the passengers off the burning car.

Using improvised means, along with assistant S. Karabanov he began to put the fire out. But the fire had spread with unusual rapidity and their eyes were made tearful by the pungent smoke. The train crew realized that it could not cope with the fire. And it was found that the fire trucks could not come up to the train. A decision came quickly: to get the train to the nearest station as soon as possible. At station Verevo the fire was put out. The fire was caused by smokers. Or to be more precise, by their criminal carelessness.

Many such examples can be cited. Disregard of the fire safety regulations and carelessness lead to a very great number of unpleasant consequences.

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CSO: 1829/303

TERMEZ HANDLES CARGOES TO AFGHANISTAN

Tashkent EKONOMIKA I ZHIZN' in Russian No 6, Jun 81 p 5

[Text] Since the beginning of this year the river workers of the port of Termez have transported hundreds of tons of cargo above the plan to friendly Afghanistan. Agricultural equipment, construction materials and other no less valuable cargoes have been delivered to the neighboring country ahead of schedule.

Hundreds of thousands of tons of cargo will be processed at the Termez river port this year.



Unloading agricultural machinery for Afghanistan

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CSO: 1829/15

## OCEAN AND RIVER

### BRIEFS

**NEW CONTAINER CARRIER LAUNCHED**--A new maritime container carrier built by the ship-builders at the "Oka" plant (Navashino, Gor'kovskaya Oblast) has been launched. The ship is named after the Communist Chilean singer Victor Khara. The ship can transport up to five thousand tons of economic cargo in a single trip. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 33, Aug 81 p 3]

**NEW DEEP WATER NAVIGATION CHANNEL**--The railway engineers of the Lower Volga have repaired the navigational course along the main street of Russia. They laid a new deep water navigation channel in the most difficult part of the river, shortening the way from Volgograd to Astrakhan by more than seven kilometers. [Excerpt] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 30 Jul 81 p 4]

**NEW TUGBOATS**--The tugboats whose manufacture was begun at the Pechora Maintenance and Repair Base permit navigation on the small northern rivers to be extended. The test-trials proved the basic advantages of the innovation--low draft and increased power. In the summer when the water level sharply falls, the new ships will help the raftsmen tow the rafts in shallow water and will transport the lumbermen to the remote taiga regions. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 24 Jul 81 p 1]

CSO: 1820/7



## MISCELLANEOUS

### UNDERWATER TUNNEL TO KANONERSKIY ISLAND DESCRIBED

Leningrad STROITEL'STVO I ARKHITEKTURA LENINGRADA in Russian No 8,  
Aug 81 pp 25-27

/Article by V. N. Bereslavskiy: "Underwater Crossing: A Unique Tunnel to Kanonerskiy Island"7

/Text7 It would seem that such a problem would exist almost anywhere but in Leningrad, a city of more than 100 bridges. In number of bridges it is a world leader. Up until now the only means of transportation between Gutuyevskiy and Kanonerskiy islands of the Neva River delta has been a ferry. This anachronism could be considered the amusing consequence of an order of Peter the Great which forbade the construction of bridges between the shores of the Neva River so that the residents of the young capitol would have to learn the trade of the sea by forcing them to use boats.

If one takes into consideration the fact that thousands of Leningrad residents live on Kanonerskiy Island, that there is a ship repair facility there, then one will agree that this long-standing policy of the city's founder seems, to put it bluntly, an obvious misunderstanding. The paradox can also be found in the fact that at one time Kanonerskiy Island was part of Gutuyevskiy Island. Naturally, this meant that there were no problems with the transportation system until the deep water sea canal was dug. The construction of this canal in the years 1875 - 1885 represented a new stage in the development of the city port, which has made it possible since then for ocean going ships to be received directly at its moorings. These ships came from Kronshtadt through the manmade 30-kilometer length of the canal. Kanonerskiy Island, while sheltering within the Neva River delta this canal from river alluvium and the port's water area from the action of strong waves, made it possible to create optimal conditions here for processing ships, for organizing warehousing space and for linking sea transport with railroad and motor vehicle transport.

The 120-meter waterway has made the island residents into islanders in the full sense of the word. They are "prisoners" of the port. In solving any vital task - going to work, to the movies, to the store or to visit - the residents of Kanonerskiy Island must coordinate their wishes with the schedule of the ferry boat. The difficulties increase with geometric progression when one must take into consideration more

than just the day-to-day problems, but also the multifaceted activity of a large plant collective, which, by the way, performs very important ship repair work. Quite often there are lines several hundreds of meters long of automobiles on both sides of the canal. The fact that the island is not joined to the "continent" costs the city a lot of money. Various industrial sectors are also affected. Significant non-production outlays are also involved.

So, in the final analysis what is the problem: so many bridges have already been built, why not build one more?

It turns out that this is no small problem. The dimensions of the bridge which meet the primary requirement of the port workers - not to disturb the rhythm of shipping traffic - are such that the bridge simply will not fit on the island. The 50-meter height of the engineering structure would extend into the harbor for several hundred meters. A low bridge, of course, would have to be a drawbridge with a span of 100 meters. But to erect it would be like throwing money into the Baltic wind: every hour it would be necessary to raise the drawbridge several times.

The option of building a subway through a tunnel by using mining tunnel shields offered a lot of problems. First the tunnel diameter is too small to permit two-way traffic of automobiles. Secondly, such a system requires that the roadbed be quite deep, which is very costly.

The best option was the plan for an underwater tunnel to be constructed by using the submerged section method. This was to be the first time that this method was used in the Soviet Union. This method of constructing water crossings has a solid history in the world. During the past three decades dozens of these underwater "streets" in lengths ranging from hundreds of meters to two or three kilometers have been constructed in various countries using this method. It is used extensively in Holland, West Germany, Canada and the USA. In many cases specialists prefer the prefabricated tunnel over other types of crossings since it possesses the following indisputable advantages: the existing nature of the water area changes very little; ship handling and drifting of ice conditions remain as before, as does the hydraulics of the water flow; transport between shores is not interrupted throughout the entire 24-hour period; the existing coastal structures and facilities are preserved, and the number of buildings subject to demolition on the approaches and the amount of ground disturbed are minimal; there are no platforms and embankments to disturb the architectural appearance of the area.

The only thing that such a tunnel loses to a bridge is that it costs more. But foreign experience and estimates show that when increasing the length of the structure, this difference is minimized.

One way or another, when the Leningrad bridge builders started to attack this innovative engineering-technical idea some 10 years ago, they really didn't have any other choice. An underwater tunnel with submersible sections (or an upside down bridge) was the only feasible

solution. As demonstrated by events that took place later, the very specific nature of erecting the structure forced the collective of Bridge Building Detachment No. 11 of the Bridge Building Trust No. 6 to organize their work on a qualitatively new engineering and technical level.

I recall my first visit to the southern tip of Kanonerskiy Island, where the installation site for assembling the tunnel sections was built. I accompanied the former chief of the Bridge Building Detachment, Yu. R. Kozhukhovskiy (who now heads Glavleningradstroy), and also the chief engineer of Bridge Building Trust No. 6, a Honored Builder of the RSFSR, K. L. Skorik. The bridge builders had recovered several hectares of land from the sea, having created a dock and lock here. They have dug a deep trench from the sea canal here. The installation site and the trench are surrounded by 10-meter dams on all sides. In the center of dock and lock they then erected just the first unit of the tunnel. In size it resembles a three-storey building 75 meters in length and walls one meter thick, which is filled with ferro-concrete reinforcement, concrete and various systems. The total weight of the reinforced concrete section was nearly 10,000 tons. In view of the size and weight the specialists were forced to ensure precision in installation - upon this much depended later on. Highly skilled engineers, Kozhukhovskiy and Skorik enthusiastically spoke about the unusual aspects of the work to be done. (Unfortunately, through no fault of the builders the completion of the project dragged on for several years.)

And then in the past two or three years the scale of the unique operations on the shores of the sea canal reached, at last, an adequate level to permit discussing the completion of the construction this year.

We will now recount the basic stages in the work. When all five sections were formed in the dock and lock, more than a million cubic meters of water were pumped into it using powerful pumps. Prior to this the units were carefully checked for hermetic seal and then floated. Then they were towed to the trench and lowered into the water from the dock-lock. While afloat the sections were at the level of the sea canal. Parallel to the path of the crossing they built a deep underwater track; while on the shore work got underway to form the tapered open downgrades of the main line and also the monolithic sectors of the tunnel.

At first the sector on Gutuyevskiy Island was the most important; this was where they prepared the runway for the first two curved sections, which were lowered to a depth of 12 to 20 meters directly beneath the railroad tracks of the Novyy Port railroad station and beneath the area of the port itself. The difficulty of this task was that traffic along the canal and railroad could not be stopped for long - the builders had only brief "windows" of time to do the more important operations. But they had to drive a deep trench from the sea canal to the place where the submerged sections were to be joined with the monolithic parts of the crossing and to "allow passage" of the trench under several threads of railroad by rigging temporary



bridges for them. The powerful sheet piling went deep into the soil and pipes one half meter in diameter, working as braces, kept the artificial shores from caving in. The geology of the subsurface beds was not the most "pleasant" surprise for the creators of the underwater main line. They constantly had to remove enormous boulders from the trench. The insidious quick ground let itself be known.



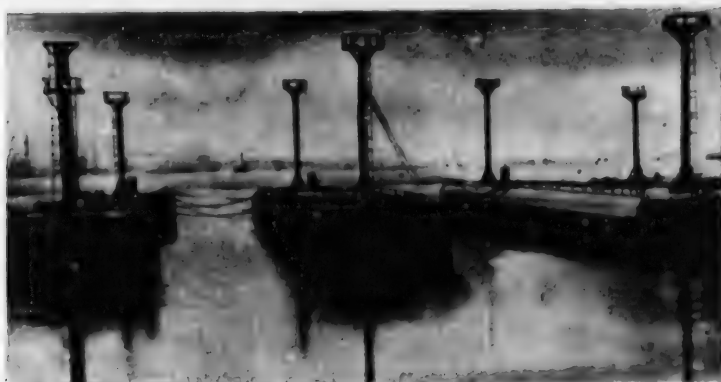
Looking like the hull of a ship on building blocks - this is how the metal casing of the future underwater section of the tunnel appeared in the beginning.

The maturity of the collective of bridge builders was especially noticeable in such conditions. It was not just the competence of the technical solutions that were made that moved the construction project forward, but also the selflessness and enthusiasm of the brigade workers, which were manifest literally at each stage in the construction of dozens original and effective innovations. High ranking foremen from the comprehensive brigades supervised by N. I. Bykov, N. I. Tikhonov, G. I. Ivantsov, and B. B. Dmitriyev, were generous in lending their rich experience to this new construction project, which was also new to them. They had gained this experience over a period of many years spent in constructing bridges in Karelia, on the Kola Peninsula, throughout the Northwest, including, of course, in Leningrad.

Almost each member of the aktiv had participated in the construction of the Aleksandr Nevskiy bridge, the modernization of Liteyny and other major undertakings, among other completed artificial structures.



The formed reinforced concrete units on the installation site of the dock-lock were carefully checked for hermetic seal.

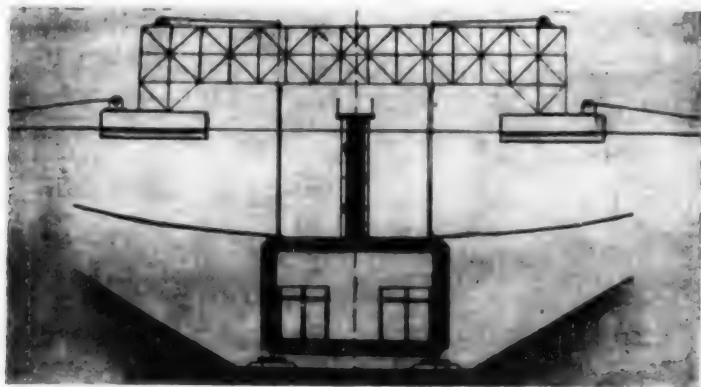


The submersion of the dock-lock.

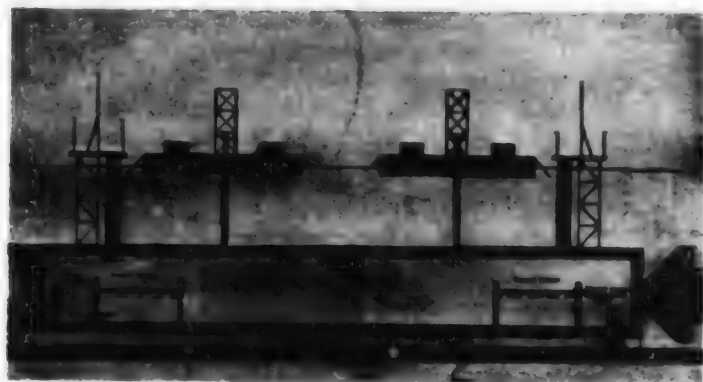


The floating sections with raised "masts" of the working and cargo shafts ready to be transported.

For the builders the most memorable period was when they transported, lowered and joined the first floating section. Everything was new to the specialists. The heavy box - resembling a reinforced concrete iceberg, the main part of which was in the water, was towed from the lock chamber using four powerful tugboats into the canal and very carefully led to the place where it was to be installed. The actions of the builders and port workers were so carefully thought out and clear that all fears connected with the possible lack of control of the large and bulky object under the action of the strong water current, were for naught. From the start of the towing operation it took only one hour for the section to reach the construction mooring, where it was safely secured.



Lowering the sections to the bottom of the trench.



Joining the sections.



The "assembled" tunnel.



"For nearly a week after this we had to wait on the weather to perform the operation of putting the section into the prepared trench," recalls the chief engineer of Bridge Building Detachment No 11, O. N. Ashurov. "There was high water and we literally had to drag the tunnel unit under the temporary bridges of the railroad station without damaging the upper layer of the tiebeam lashing of the trench. The most favorable time to perform this operation was at night. Then the section, you might say, was floated to its intended destination."

Although foreign experience in erecting tunnels by submerging sections is significant, one can now say that the operations that were performed in Leningrad to a large extent not only filled in the gaps in such experience for our specialists, but in many ways enriched the practice of tunnel building. This can be seen particularly in the complex, from an equipment angle, process of lowering and joining the sections, which requires extreme precision and coordination in the activities of dozens of mechanisms, instruments and various intricate devices and systems. And, of course, the skilfull interaction of specialists.

I will dwell on just one interesting detail. In joining the sections an important role is played by a specially manufactured rubber design that is called the "dzhina". In framing the end of each section, the "dzhina" is subjected to tremendous hydrostatic pressure during the underwater joining of the units. Under this pressure the end sectors are hermetically sealed in a most reliable manner. The ends are subsequently slabbed over with concrete.

The lowering of all of the sections of the underwater crossing was completed in the summer of 1980. Then the builders, while examining the metal end constructions, expanded their work in the tunnel itself. The foundation of the roadbed was poured in concrete and the pedestrian barriers were installed. The air ducts were installed and the joined units were poured. Work was also underway above, where they built a building for the technical services for maintaining the tunnel.

At the start of this summer during the final stages of the construction, the work was in progress on Kanonerskiy Island. Here it was necessary to do the more complicated operations in linking the shore section of the tunnel with the underwater section. It is not without reason that I call this part of the task the shock front, for this is where the maximum concentration of the efforts of hundreds of workers, their skill, experience, and professional mastery are required.

For the first time in the Soviet Union the bridge builders constructed such a wide, deep trench, surrounded by a channel. But this did not help to create conditions for the formation of the monolithic tunnel sector - the quicksand interfered. The subway builders were brought in to help. Dozens of wells, through which was fed a freezing liquid, were drilled deep in the earth. The artificial permafrost, which enclosed the zone of construction, made it possible to continue work. It was more difficult to ensure the reliable hermetic seal in the zone of the joining. But in this case the technical concept, advanced methods of construction and the skill of the workers made it possible to speed up the completion of the various difficult operations.

V. N. Dagdanelidi, the chief of this sector, began this construction project as the leader of a brigade of carpenters. Without leaving the job he has studied at the institute. "I studied twice as effectively as the other students," he asserts with a smile. "Such a project provides so much knowledge and forces one to look for ways to do things and to think, whether you want to or not. But it makes you into a real engineer." To confirm these words he lists the names of specialists, who, while experiencing the urgent need for technical knowledge required by the project, have gone on to study: K. S. Pridatchenko, Ya. V. Makarov, V. I. Shirochkin, M. A. Sukhanov, and V. N. Zhuravlev. It is thought that this is the most characteristic feature of the Kanonerskiy Tunnel - in building it, people grew up, each of those who participated in this unique project attended a wonderful school here. The new method of erecting underwater crossings will undoubtedly be tested more than once. It is especially promising for such cities as Leningrad, where, in particular, it is planned to construct two more such tunnels under the Neva River.

When the first underwater crossing is completed, which will happen this year, the travel time to Kanonerskiy Island will take two to three minutes altogether by motor vehicle.

The tunnel plan was developed by the Lenmetrogioprotrans collective. The technical aspects of the project were developed by specialists from the Leningrad Branch of the Special Design Bureau of Glavmostostroy.

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